Chemical structure, water absorbency and thermal properties of poly(acrylamide-*co*-acrylic acid)-*grafed*-poly(styrene-*co*-methyl methacrylate) "raspberry" – shape like structure microgels

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ABSTRACT

This contribution presents the characterization of poly(acrylamide-*co*-acrylic acid)-*grafted*-poly(styrene-*co*-methyl methacrylate) [poly(AAm-*co*-AAc)-*g*-poly(St-*co*-MMA)] The chemical structure of poly(AAm-*co*-AAc)-*g*-poly(St-*co*-MMA) microgels was proposed. The effect of MBA contents on the degree of cross-linking (%), water absorbency (EWC, %), glass transition temperature, T_g and thermal degradation were studied. The degree of cross-linking (%) and EWC, % increased at 1.5 to 1.675 wt.% of MBA might be due to mono cross-links of MBA. The fluctuation of T_g and melting temperature (T_m) from 1.85 to 2.2 wt.% of MBA might be due to di, poly and cyclic cross-links of MBA. Decomposition of poly(AAm-*co*-AAc)-*g*-poly(St-*co*-MMA) was slightly affected by increasing in MBA contents from 1.5 to 2.2 wt.%. T_g of poly(AAm-*co*-AAc)-*g*-poly(St-*co*-MMA) was decreased at 1.5 to 1.675 wt.% of MBA due to increase in ordered structure and crystallinity content, which led to an increase in T_m .

KEYWORDS:

Core-shell; Cross-linking; Emulsion; Microgels; Network